Handout #2 items circled / Attachment 1B CNO 8/4/91
were not reviewed
in the technician part of the class.

8/13/91 copy mailed to Tom Eggleston

TECHNICIAN SEMINAR A-B-C.

Technicians have all privileges above 50 MHz. Techs, General, Advanced, and Extra can operate on 50 MHZ (6 meters), 144 MHz (2 meters), 220 MHz, and 440 MHz.
note: novice's are NOT AUTHORIZED on 50 MHZ, 144 MHZ and 440 MHz.

The F.C.C. currently issues Amateur licenses for 10 years, there is a 2 YEAR GRACE PERIOD for an expired 10 year license.

When the FCC rules specify a limit of transmitting power from an amateur station, the point of measurement it at the antenna terminals of the transmitter or amplifier.
Remember, never use more power than what is required for efficient communications. Example: If you can communicate efficiently with 25 watts on side band don't run 200 watts. This can be interpreted many ways so after you have established communications using 200 watts, try reducing your power while maintaining good communications.

In the novice sections we learned that the rules require ID every 10 minutes and at the end of the conversation. Now we have one more item, when using radio telephony SSB FM AM ENGLISH MUST BE USED FOR IDENTIFICATION.

When radio control operations of remote craft ie (radio controlled airplanes.) The call sign, name and address must be affixed to the transmitter.

Third party communications. This means your non-licensed friend can talk on your radio if a licensed control operator is present (which is you). They can talk to people in a foreign country which the US shares a third-party agreement.

Indecent and obscene word are not permitted in amateur radio transmissions.

OPERATING PROCEDURES

When using a repeater, keep your transmissions short and thoughtful. A long transmission may prevent someone with a emergency from using the repeater. Pause a couple of seconds between transmissions to allow someone who really needs to use the repeater to make his intentions known. Don't be long winded and say the same thing over and over, it is better to be pause and collect your thoughts than to let the mouth wander aimlessly.

The main purpose of a repeater is to extend the range of mobile and low-power stations.

TECHNICIAN D-E-F

RESISTANCE

Resistance is something that opposes motion. In this case, resistance is the opposition of the flow of electrons.

Resistors generate heat because they convert electrical energy to heat energy.

The PRIMARY FUNCTION OF A RESISTOR is to LIMIT the CURRENT in an ELECTRICAL CIRCUIT.

The basic unit of resistance is the OHM.

RESISTORS IN SERIES

$$\underset{100\text{ ohms}}{R\text{-}1} + \underset{25\text{ ohms}}{R\text{-}2} + \underset{50\text{ ohms}}{R\text{-}3} + \underset{125\text{ ohms}}{R\text{-}4} = \underset{300\text{ ohms}}{Rn}$$

RESISTORS IN PARALLEL

To calculate the total resistance of two resistors in PARALLEL we take the product over the sum.

$$R_{total} = \frac{R1 \times R2}{R1 + R2}$$

$$R_{total} = \frac{50 \times 50}{50 + 50} = \frac{2500}{100} = 25 \text{ ohms}$$

To calculate the total resistance of three or more resistors in PARALLEL. R1 = 25 ohms , R2 = 10 ohms, R3 = 100 ohms

$$R_{total} = \frac{1}{\frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3}}$$

$$R_{total} = \frac{1}{\frac{1}{25} \quad \frac{1}{10} \quad \frac{1}{100}}$$

$$R_{total} = \frac{1}{0.04 + 0.1 + 0.01} = \frac{1}{0.15} = 6.67 \text{ ohms}$$

not discussed

TECHNICIAN GHI

The term RF CARRIER indicates a radio frequency signal with no modulation.

Different signals have signal widths. The narrowest is CW and the widest is FM.

CW RTTY SSB FM.

From this information we can have more CW signals in a given frequency range, and fewer FM signals. The FCC gives us 350 KHc's on 20 meters. The entire band is 14.000 to 14.350 MHz's. As a General Class your CW sub-band is 14.025 to 14.150 and the phone band (AM) and SSB 14.225 to 14.350. FM is not authorized on frequencies below 29.700 MHz because the frequency modulation (FM) exceeds the band width. We can conclude that the most efficient use of frequency spectrum is CW and RTTY.

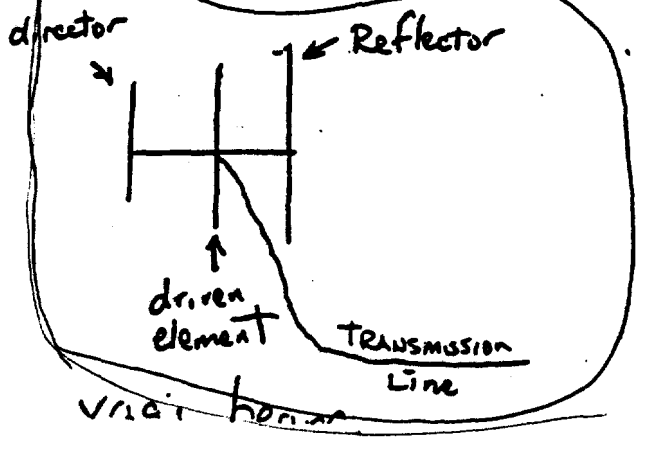
SPLATTER is caused by overmodulation of a transmitter. Overmodulation results in the creation of unwanted sidebands that will interfere with signals on adjacent frequencies.

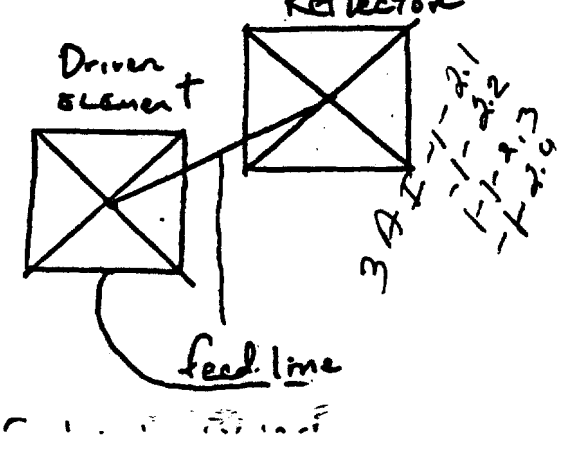
not discussed

ANTENNAS AND FEEDLINES

YAGI antenna. A Yagi is a beam antenna it is a half wave dipole plus one or more elements. The feed line is connected to the DRIVEN ELEMENT. The PARASITIC ELEMENTS are not connected they receive their energy from the electromagnetic radiation of the driven element. The parasitic elements increase the gain of the antenna. If only two elements are used one is a driven element and the other is a REFLECTOR element. Additional elements are DIRECTORS.

The other common beam antenna is a QUBICAL QUAD. A QUAD antenna is one or more rectangular loops of wire. It is important to know that this antenna is ONE ELECTRICAL WAVELENGTH. A common quad antenna consists of a driven element and a director element. To polarize the quad horizontal connect the feed line in the center of a horizontal side. To polarize it vertically, connect the feed line in the center of a vertical side.





3BT-3-3.3 1/24

2 D7-1.1 4.1.2

THE STANDING WAVE RATIO (SWR) is the ratio of the maximum voltage to the minimum voltage along a line. The maximum current to the minimum current gives the same ratio. The SWR is ameasure of the mismatch between the transmission line and the antenna. It causes power to be reflected back to the transmitter from the antenna.

3BT-3-1.1 1.2

FORWARD POWER is the power that leaves the transmitter and travels along the feedline to the antenna.

3BT-3-2.1 3-2.2

REFLECTED POWER if the antenna feedpoint resistance is not equal to the charactaristic impedance of the transmission line. Some of the power that reaches the antenna is reflected back to the transmitter, ideally the reflected power should be zero.

3BT-3-3.1 3BT-3-3.2

COAX CABLE is unbalanced feed line. As the SWR increases the POWER LOSS increases. Think of SWR as inefficiency.

PARALLEL OPEN-WIRE LINE is a balanced feed-line, it can tolerate a high SWR without too much loss of power.

3BT-5-3.2

The feed-line length effects the amount of signal loss, as the feed-line length increases, signal loss increases.

As the operating frequency increases the losses in the feed-line increases.

Not discussed

not discussed

THE FOUR COMMON TYPES OF RESISTOR CONSTRUCTION.
1. Carbon-composition, 2. Carbon-film, 3. Metal-film,
4. Wire-wound.

OHMS LAW

Ohm's Law is the mathematical relationship between RESISTANCE, CURRENT, and the applied VOLTAGE in a circuit.

Ohm's Law states that the current is directly proportional to the voltage and is inversely proportional to the resistance.

I is the current in amperes
E is the voltage in volts
R is the resistance

$$I = \frac{E}{R} \qquad R = \frac{E}{I}$$

$$E = I \times R$$

CAPACITANCE

A CAPACITOR STORES (ELECTRIC) ENERGY IN AN ELECTRIC FIELD.

The basic unit of capacitance is the FARAD.

A simple capacitor is formed by separating two conductive plates with an insulating material or (DIELECTRIC). If one plate is connected to the positive side of the battery and the other plate to the negative terminal, a surplus of electrons on one plate is built up.

not discussed

The capacitance value of a capacitor is determined by three factors.

1. The area of the plate surfaces.
2. The type of insulating material.
3. The distance between the plates and the insulating material.

Connecting capacitors in series has the effect of increasing the distance between the plate, thereby reducing the total capacitance.

Chris McElwain

PACIFIC BELL
A Pacific Telesis Company

8-4-91 Tech. Elan H901

Element 3A

Legend -

- Encircled letter (Ⓑ) indicates correct answer.
- Pg # (Pg 9) indicates where in my notes you can find the classroom review for this question
- HO # Pg # (HO #2 Pg 1) indicates on which page # of which handout you can find this question was reviewed
- # AA #. # (3AA10.4) is the specific question # from the question pool.

Attachment 2

8/4/91

1. Where must the writing indicating the station call sign and the licensee's name and address be affixed in order to operate under the special rules for radio control of remote model craft and vehicles?
   A. It must be in the operator's possession
   B. It must be affixed to the transmitter
   C. It must be affixed to the craft or vehicle
   D. It must be filed with the nearest FCC Field Office

2. What is the term used to define the average power supplied to the antenna transmission line during one RF cycle at the crest of the modulation envelope?
   A. Peak transmitter power
   B. Peak output power
   C. Average radio-frequency power
   D. Peak envelope power

3. How often do amateur service licenses generally need to be renewed?
   A. Every 10 years
   B. Every 5 years
   C. Every 2 years
   D. They are lifetime licenses

4. Which language(s) must be used when making the station identification by telephony?
   A. The language being used for the contact may be used if it is not English, providing the US has a third-party traffic agreement with that country
   B. English must be used for identification
   C. Any language may be used, if the country which uses that language is a member of the International Telecommunication Union
   D. The language being used for the contact must be used for identification purposes

5. What kinds of one-way communications by amateur stations are not considered broadcasting?
   A. All types of one-way communications by amateurs are considered by the FCC as broadcasting
   B. Beacon operation, remote control of a device, emergency communications, information bulletins consisting solely of subject matter of direct interest to the amateur service, and telegraphy practice
   C. Only code-practice transmissions conducted simultaneously on all available amateur bands below 30 MHz and conducted for more than 40 hours per week are not considered broadcasting
   D. Only actual emergency communications during a declared communications emergency are exempt

6. What is the term used to describe messages sent into or out of a disaster area that pertain to a person's well being?
   A. Emergency traffic
   B. Tactical traffic
   C. Formal message traffic
   D. Health and welfare traffic

7. What is the usual input/output frequency separation for stations in repeater operation in the 70-centimeter band?
   A. 1.6 MHz
   B. 5 MHz
   C. 600 kHz
   D. 5 kHz

8. Why should users of a station in repeater operation keep their transmissions short and thoughtful?
   A. A long transmission may prevent someone with an emergency from using the repeater
   B. To see if the receiving station operator is still awake
   C. To give any non-hams that are listening a chance to respond
   D. To keep long-distance charges down

9. At what time of day does maximum ionization of the ionosphere occur?
   A. Dusk
   B. Midnight
   C. Midday
   D. Dawn

10. Ducting occurs in which region of the atmosphere?
   A. F2
   B. Ionosphere
   C. Troposphere
   D. Stratosphere

11. What causes ionospheric absorption of radio waves?
   A. A lack of D layer ionization
   B. D layer ionization
   C. The presence of ionized clouds in the E layer
   D. Splitting of the F layer

12. Large amounts of RF energy may cause damage to body tissue, depending on the wavelength of the signal, the energy density of the RF field, and other factors. How does RF energy effect body tissue?
   A. It causes radiation poisoning
   B. It heats the tissue
   C. It cools the tissue
   D. It produces genetic changes in the tissue

13. If a directional RF wattmeter indicates 96 watts forward power and 4 watts reflected power, what is the actual transmitter output power?
A. 80 watts
B. 88 watts
C. 92 watts
D. 100 watts

14. What station accessory is used in place of an antenna during transmitter tests so that no signal is radiated?
A. A Transmatch
B. A dummy antenna
C. A low-pass filter
D. A decoupling resistor

15. How is an ammeter typically connected to a circuit under test?
A. In series with the circuit
B. In parallel with the circuit
C. In quadrature with the circuit
D. In phase with the circuit

16. When 120 volts is measured across a 47000-ohm resistor, approximately how much current is flowing through it?
A. 392 A
B. 39.2 A
C. 26 mA
D. 2.6 mA

17. What is a picofarad?
A. A basic unit of capacitance equal to 10\-12/ farads
B. A basic unit of capacitance equal to 10\-6/ farads
C. A basic unit of capacitance equal to 10\-2/ farads
D. A basic unit of capacitance equal to 10\6/ farads

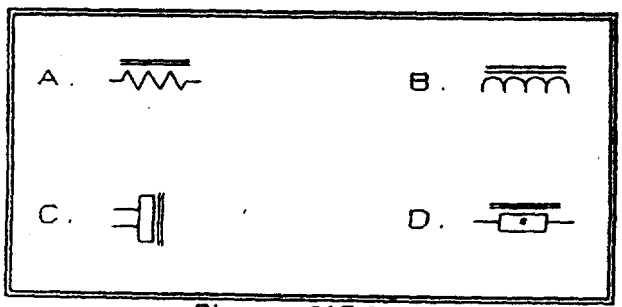


Diagram 3AF-2-4.2

18. What is the symbol used to represent an iron-core inductor on schematic diagrams? (Please refer to Diagram 3AF-2-4.2)
A. Symbol A
B. Symbol B
C. Symbol C
D. Symbol D

19. For radio frequency power applications, which type of inductor has the least amount of loss?
A. Magnetic wire
B. Iron core
C. Air core
D. Slug tuned

20. What circuit is likely to be found in all types of receivers?
A. An audio filter
B. A beat frequency oscillator
C. A detector
D. An RF amplifier

21. How would you transmit packet using an FM 2-meter transceiver?
A. Use your telegraph key to interrupt the carrier wave
B. Modulate your FM transmitter with audio tones from a terminal node controller
C. Use your mike for telephony
D. Use your touch-tone (DTMF) key pad to signal in Morse code

22. What is the FCC emission designator for a Morse code telegraphy signal produced by switching the transmitter output on and off?
A. Test
B. AM phone
C. CW
D. RTTY

23. What type of feed line is best suited to operating at a high standing wave ratio?
A. Coaxial cable
B. Flat ribbon "twin lead"
C. Parallel open-wire line
D. Twisted pair

24. What is a cubical quad antenna?
A. Four parallel metal tubes, each approximately 1/2 electrical wavelength long
B. Two or more parallel four-sided wire loops, each approximately one electrical wavelength long
C. A vertical conductor 1/4 electrical wavelength high, fed at the bottom
D. A center-fed wire 1/2 electrical wavelength long

25. What is an unbalanced line?
A. Feed line with neither conductor connected to ground
B. Feed line with both conductors connected to ground to suppress harmonics
C. Feed line with one conductor connected to ground
D. Feed line with the outer conductor connected to ground at uneven intervals

W5YI Volunteer Examiner Coordinator
Element 3A - Technician Examination - Answers to Series H901

1.	B	(3AA-10.4)
2.	D	(3AA-6-1.2)
3.	A	(3AA-3.1)
4.	B	(3AA-8-2.1)
5.	B	(3AA-13.1)
6.	D	(3AB-6-2.1)
7.	B	(3AB-2-3.2)
8.	A	(3AB-2-1.3)
9.	C	(3AC-3.2)
10.	C	(3AC-7.1)
11.	B	(3AC-2.4)
12.	B	(3AD-11-1.1)
13.	C	(3AD-5-2.2)
14.	B	(3AD-9.4)
15.	A	(3AD-3-1.1)
16.	D	(3AE-2.7)
17.	A	(3AE-4-2.3)
18.	B	(3AF-2-4.2)
19.	C	(3AF-2-1.4)
20.	C	(3AG-4-1.1)
21.	B	(3AH-2-6.2)
22.	C	(3AH-2-2.1)
23.	C	(3AI-3-3.2)
24.	B	(3AI-1-2.1)
25.	C	(3AI-4-1.2)

W5YI Volunteer Examiner Coordinator
Element 3A - Technician Examination - Answers to Series G901

1.	C	(3AA-12.2)
2.	B	(3AA-2.3)
3.	B	(3AA-6-4.1)
4.	D	(3AA-13.2)
5.	C	(3AA-8-3.1)
6.	C	(3AB-3.3)
7.	C	(3AB-2-2.1)
8.	D	(3AB-4.2)
9.	A	(3AC-7.4)
10.	C	(3AC-1-4.3)
11.	B	(3AC-3.4)
12.	B	(3AD-9.2)
13.	A	(3AD-6.1)
14.	A	(3AD-11-1.2)
15.	D	(3AD-3-2.1)
16.	D	(3AE-1-2.2)
17.	B	(3AE-3-4.2)
18.	D	(3AF-2-1.3)
19.	D	(3AF-3-3.3)
20.	C	(3AG-4-2.2)
21.	A	(3AH-2-6.1)
22.	D	(3AH-2-4.2)
23.	C	(3AI-5-1.1)
24.	C	(3AI-2-1.2)
25.	C	(3AI-5-2.1)

Attachment 3 Handout 3
8/24/91

CALIFORNIA AMATEUR RADIO SCHOOL

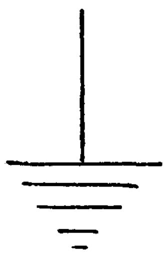
213-301-1597
MARINA del REY, CALIFORNIA 90292

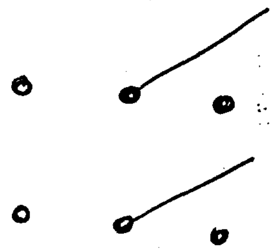
SCHEMATICS NOVICE/TECH

variable Resistor.

RESISTOR

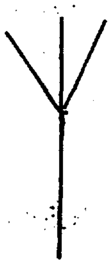
EARTHGROUND





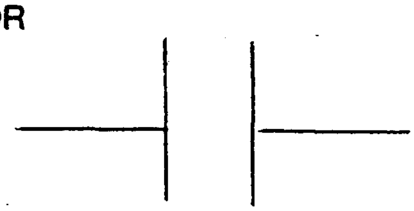
double pole double throw.

ANTENNA



IRON CORE INDUCTOR

CAPACITOR



only diagram needed to 1 60

Chris McElwain

PACIFIC BELL
A Pacific Telesis Company

8-24-91 Novice Exam
H901
Element 2

Legend
- Encircled letter (Ⓒ) indicates correct answer
- Pg # (Pgs 2 & 10) indicates one or two of the places in my notes where you can find the classroom review for this question.
- H03 - is for Handout #3 which was the only handout referred to in this class during the review session
- # A # . # (2A10.9) is the specific question # from the question pool

Attachment 4

8/24/91

1. If you are operating your amateur station on 21150 kHz, in what meter band are you operating?
   A. 80 meters
   B. 40 meters
   (C.) 15 meters
   D. 10 meters

2. The amateur service rules were designed to provide a radio communications service that meets five fundamental purposes. What are those principles?
   A. Recognition of business communications, advancement of the radio art, improvement of communication and business skills, increase in the number of trained radio operators and electronics experts, and the enhancement of international goodwill
   (B.) Recognition of emergency communications, advancement of the radio art, improvement of communication and technical skills, increase in the number of trained radio operators and electronics experts, and the enhancement of international goodwill
   C. Recognition of emergency communications, preservation of the earliest radio techniques, improvement of communication and technical skills, maintain a pool of people familiar with early tube-type equipment, and the enhancement of international goodwill
   D. Recognition of emergency communications, advancement of the radio art, improvement of communication and technical skills, increase in the number of trained radio operators and electronics experts, and the enhancement of a sense of patriotism and nationalism

3. If you were to receive a voice distress signal from a station on a frequency outside your operator privileges, what restrictions would apply to assisting the station in distress?
   A. You would not be allowed to assist the station because the frequency of its signals were outside your operator privileges
   B. You would be allowed to assist the station only if your signals were restricted to the nearest frequency band of your privileges
   C. You would be allowed to assist the station on a frequency outside of your operator privileges only if you used international Morse code
   (D.) You would be allowed to assist the station on a frequency outside of your operator privileges using any means of radio communications at your disposal

4. What emission types are Novice control operators permitted to use from 3700 to 3750 kHz?
   A. Phone only
   B. CW and phone
   C. All amateur emission privileges authorized for use on those frequencies
   D. CW only

5. What emission types are Novice control operators permitted to use on the amateur 220-MHz band in ITU Region 2?
   A. CW and phone only
   B. CW and data only
   C. Data and phone only
   (D.) All amateur emission privileges authorized for use on 220 MHz

6. Another amateur gives you permission to use her amateur station. What are your responsibilities, as the control operator?
   (A.) Both you and she are equally responsible for the proper operation of her station
   B. Only the station licensee is responsible for the proper operation of the station, not you the control operator
   C. You must be certain the station licensee has given proper FCC notice that you will be the control operator
   D. You must inspect all antennas and related equipment to ensure they are working properly

7. When is an amateur operator permitted to transmit a message to a foreign country for a third party?
   A. Anytime
   B. Never
   C. Anytime, unless there is a third-party traffic agreement between the US and the foreign government
   (D.) When there is a third-party traffic agreement between the US and the foreign government, or when the third party is eligible to be the control operator of the station

8. What is the license class immediately above Novice class?
   A. The Digital class license
   (B.) The Technician class license
   C. The General class license
   D. The Experimenter's class license

9. Which one of the following call signs is a valid US amateur call?
   A. CE2FTF
   B. G3GVA
   C. UA1ZAM
   (D.) AA2Z

10. When are communications pertaining to business or commercial affairs of any party permitted in the amateur service?
(A.) Only when the immediate safety of human life or immediate protection of property is threatened
B. There are no rules against conducting business communications in the amateur service
C. No business communications of any kind are ever permitted in the amateur service
D. Business communications are permitted between the hours of 9 AM to 5 PM, only on weekdays

11. What is one meaning of the Q signal "QTH"?
A. Time here is
B. My name is
C. Stop sending
(D.) My location is ...

12. What is the meaning of the Morse code character AR?
A. Only the called station transmit
B. All received correctly
(C.) "Over" or End of transmission
D. Best regards

13. What type of propagation uses radio signals refracted back to earth by the ionosphere?
(A.) Sky wave
B. Earth-moon-earth
C. Ground wave
D. Tropospheric

14. Why should all antenna and rotator cables be grounded when an amateur station is not in use?
A. To lock the antenna system in one position
B. To avoid radio frequency interference
C. To save electricity
(D.) To protect the station and building from damage due to a nearby lightning strike

15. If you are notified that your amateur station is causing television interference, what should you do first?
(A.) Make sure that your amateur equipment is operating properly, and that it does not cause interference to your own television
B. Immediately turn off your transmitter and contact the nearest FCC office for assistance
C. Install a high-pass filter at the transmitter output and a low-pass filter at the antenna-input terminals of the TV
D. Continue operating normally, since you have no legal obligation to reduce or eliminate the interference

16. What precautions should you take before removing the shielding on a UHF power amplifier?
A. Make sure all RF screens are in place at the antenna
B. Make sure the feed line is properly grounded
(C.) Make sure the amplifier cannot be accidentally energized
D. Make sure that the RF leakage filters are connected

17. What instrument is used to indicate the relative impedance match between a transmitter and antenna?
A. An ammeter
B. An ohmmeter
C. A voltmeter
(D.) An SWR meter

18. List at least four good electrical insulators.
(A.) Glass, air, plastic, porcelain
B. Glass, wood, copper, porcelain
C. Paper, glass, air, aluminum
D. Plastic, rubber, wood, carbon

19. Signals above what frequency are usually called radio-frequency signals?
A. 20 Hz
B. 2000 Hz
(C.) 20,000 Hz
D. 1,000,000 Hz

20. Your receiver dial is calibrated in megahertz and shows a signal at 3.525 MHz. At what frequency would a dial calibrated in kilohertz show the signal?
A. 0.003525 kHz
(B.) 3525 kHz
C. 35.25 kHz
D. 3,525,000 kHz

21. What is the term used to describe a current that flows first in one direction, then in the opposite direction, over and over?
(A.) Alternating current
B. Direct current
C. Negative current
D. Positive current

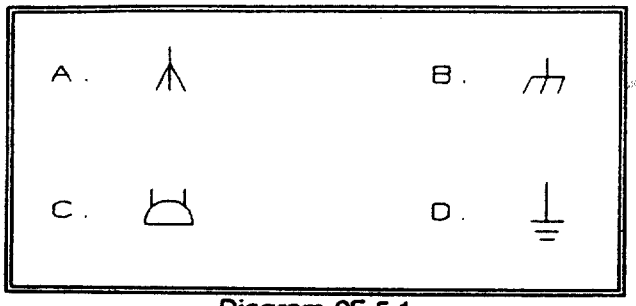


Diagram 2F-5.1

22. What is the symbol normally used to represent an earth-ground connection on schematic diagrams? (Please refer to Diagram 2F-5.1)
A. Symbol A
B. Symbol B
C. Symbol C
(D.) Symbol D

Pg 17 HO #3 2F 5.1

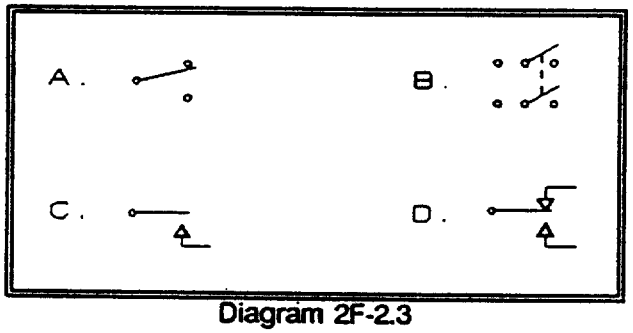


Diagram 2F-2.3

23. What is the symbol used on schematic diagrams to represent a double-pole, double-throw switch? (Please refer to Diagram 2F-2.3)
A. Symbol A
(B.) Symbol B
C. Symbol C
D. Symbol D

Pg 17 HO #3 2F 2.3

24. In an amateur station designed for Morse radiotelegraph operation, what station accessory will you need to go with your transmitter?
A. A terminal-node controller
(B.) A telegraph key
C. An SWR meter
D. An antenna switch

Pg 15 2G 2.1

25. You discover that your tube-type transmitter power amplifier is radiating spurious emissions. What is the most likely cause of this problem?
A. Excessively fast keying speed
B. Undermodulation
(C.) Improper neutralization
D. Tank-circuit current dip at resonance

Pgs 11 & 14 2H 7.1

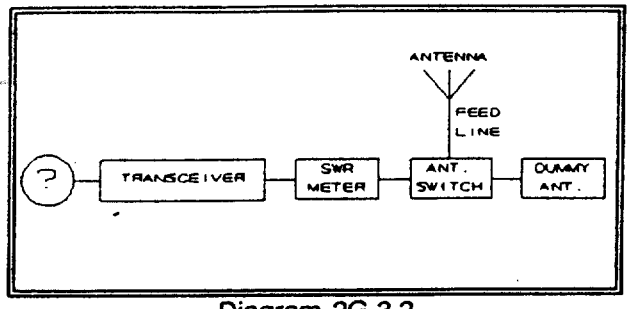


Diagram 2G-3.2

26. What is the unlabeled block (?) in this diagram of a radiotelephone station? (Please refer to Diagram 2G-3.2)
A. A splatter filter
B. A terminal-voice controller
C. A receiver audio filter
(D.) A microphone

2G 3.2 Pg's 15 & 16

27. What can be done to the power supply of a CW transmitter to avoid chirp?
A. Resonate the power supply filters
(B.) Regulate the power supply output voltages
C. Use a buffer amplifier between the transmitter output and the feed line
D. Hold the power supply current to a fixed value

Pgs 15 2H 3.2

28. On the Yagi antenna shown in Figure 2I-4, what is the name of section C?
(A.) Director
B. Reflector
C. Boom
D. Driven element

Pgs 12 & 15 Had to request this diagram - Sandy provided - 2I 4-22

29. How is the approximate length (in feet) of a half-wavelength dipole antenna calculated?
A. By substituting the desired operating frequency for f in the formula: 150 / f (in MHz)
B. By substituting the desired operating frequency for f in the formula: 234 / f (in MHz)
C. By substituting the desired operating frequency for f in the formula: 300 / f (in MHz)
(D.) By substituting the desired operating frequency for f in the formula: 468 / f (in MHz)

Pgs 11 & 14 2I 1.5

30. A certain antenna system has an impedance of 1000 ohms on one band. What must you use to connect this antenna system to the 50-ohm output on your transmitter?
A. A balun
B. An SWR bridge
(C.) An impedance matching device
D. A low-pass filter

Pgs 12 & 15 2I 8.2

Chris McElwain

PACIFIC BELL
A Pacific Telesis Company

8-24-91 Tech Exam
T901
Element 3A

Legend
- Encircled letter (Ⓓ) indicates correct answer
- Pg # (Pgs 1, 7 & 19) indicate one, two or three of the places in my notes where you can find the classroom review for this question
- #A#, # (3AA11-2.1) is the specific question # from the question pool.

Attachment 5

8-24-91

1. Under what circumstances does the FCC declare a temporary state of communication emergency?
A. When a declaration of war is received from Congress
B. When the maximum usable frequency goes above 28 MHz
C. When communications facilities in Washington, DC, are disrupted
(D.) When a disaster disrupts normal communications systems in a particular area

2. In an exchange of international third-party communications, when is the station identification procedure required?
A. Only at the beginning of the communications
(B.) At the end of each exchange of communications
C. The station identification procedure is not required during international third party communications
D. Only at the end of multiple exchanges of communications

3. Which operator licenses authorize privileges on 52.525 MHz?
A. Extra, Advanced only
B. Extra, Advanced, General only
(C.) Extra, Advanced, General, Technician only
D. Extra, Advanced, General, Technician, Novice

4. What are the station identification requirements for an amateur station transmitting signals to control a model craft?
A. Once every ten minutes, and at the beginning and end of each transmission
B. Once every ten minutes
C. At the beginning and end of each transmission
(D.) Station identification is not required provided that a label indicating the station call sign and the station licensee's name and address is affixed to the station transmitter

5. Notwithstanding the numerical limitations in the FCC Rules, how much transmitting power shall be used by an amateur station?
A. There is no regulation other than the numerical limits
B. The minimum power level required to achieve S9 signal reports
(C.) The minimum power necessary to carry out the desired communication
D. The maximum power available, as long as it is under the allowable limit 3AA-6-3.1 D What is the maximum transmitting power permitted an amateur station on 146.52 MHz?

6. What is the meaning of: "Your report is five seven..."?
(A.) Your signal is perfectly readable and moderately strong
B. Your signal is perfectly readable, but weak
C. Your signal is readable with considerable difficulty
D. Your signal is perfectly readable with near pure tone

7. What is the term used to describe first-response communications in an emergency situation?
(A.) Tactical communications
B. Emergency communications
C. Formal message traffic
D. National Traffic System messages

8. What is the usual input/output frequency separation for stations in repeater operation in the 2-meter band?
A. 1 MHz
B. 1.6 MHz
C. 170 Hz
(D.) 0.6 MHz

9. What effect does tropospheric bending have on 2-meter radio waves?
(A.) It increases the distance over which they can be transmitted
B. It decreases the distance over which they can be transmitted
C. It tends to garble 2-meter phone transmissions
D. It reverses the sideband of 2-meter phone transmissions

10. What are the two distinct sub-layers of the F layer of the ionosphere during the daytime?
A. Troposphere and stratosphere
(B.) F1 and F2
C. Electrostatic and electromagnetic
D. D and E

11. How are VHF signals within the range of the visible horizon propagated?
A. By sky wave
(B.) By direct wave
C. By plane wave
D. By geometric wave

12. What is the purpose of the ANSI RF protection guide?
A. It protects you from unscrupulous radio dealers
(B.) It sets RF exposure limits under certain circumstances
C. It sets transmitter power limits
D. It sets antenna height requirements

13. What is a multimeter?
A. An instrument capable of reading SWR and power
B. An instrument capable of reading resistance, capacitance and inductance
C. An instrument capable of reading resistance and reactance
D. An instrument capable of reading voltage, current and resistance

14. When adjusting a transmitter filter circuit, what device is connected to the transmitter output?
A. A multimeter
B. A set of Litz wires
C. A receiver
D. A dummy antenna

15. What is a directional wattmeter?
A. An instrument that measures forward or reflected power
B. An instrument that measures the directional pattern of an antenna
C. An instrument that measures the energy consumed by the transmitter
D. An instrument that measures thermal heating in a load resistor

16. What is a microfarad?
A. A basic unit of capacitance equal to 10\-12/ farads
B. A basic unit of capacitance equal to 10\-6/ farads
C. A basic unit of capacitance equal to 10\-2/ farads
D. A basic unit of capacitance equal to 10\6/ farads

17. What is Ohm's Law?
A. A mathematical relationship between resistance, voltage and power in a circuit
B. A mathematical relationship between current, resistance and power in a circuit
C. A mathematical relationship between current, voltage and power in a circuit
D. A mathematical relationship between resistance, current and applied voltage in a circuit

18. What are the electrical properties of an inductor?
A. An inductor stores a charge electrostatically and opposes a change in voltage
B. An inductor stores a charge electrochemically and opposes a change in current
C. An inductor stores a charge electromagnetically and opposes a change in current
D. An inductor stores a charge electromechanically and opposes a change in voltage

19. What is a capacitor dielectric?
A. The insulating material used for the plates
B. The conducting material used between the plates
C. The ferrite material that the plates are mounted on
D. The insulating material between the plates

20. What circuit attenuates electrical energy above a certain frequency and below a lower frequency?
A. A band-pass filter
B. A high-pass filter
C. An input filter
D. A low-pass filter

21. If the modulator circuit of your FM transmitter fails, what emission type would likely result?
A. An unmodulated carrier wave
B. A phase-modulated carrier wave
C. An amplitude-modulated carrier wave
D. A frequency-modulated carrier wave

22. What other emission does phase modulation most resemble?
A. Amplitude modulation
B. Pulse modulation
C. Frequency modulation
D. Single-sideband modulation

23. What type of parasitic beam antenna uses two or more straight metal-tubing elements arranged physically parallel to each other?
A. A delta loop antenna
B. A quad antenna
C. A Yagi antenna
D. A Zepp antenna

24. What is a balanced antenna?
A. A symmetrical antenna with one side of the feed point connected to ground
B. An antenna (or a driven element in an array) that is symmetrical about the feed point
24. C.A symmetrical antenna with both sides of the feed point connected to ground, to balance out harmonics
D. An antenna designed to be mounted in the center

25. How can you minimize exposure to radio frequency energy from your transmitting antennas?
A. Use vertical polarization
B. Use horizontal polarization
C. Mount the antennas where no one can come near them
D. Mount the antenna close to the ground

Attachment 6

TRANSCRIPT OF TAPE RECORDING MADE AT SEPTEMBER 14, 1991, EXAMINATION SESSION FROM START OF CONVERSATION ABOUT MORSE CODE TEST TO START OF CODE TEST

Sandra Crane	(inaudible) ... five people ... (inaudible) ... Novice. One? One.
	(unintelligible voices)
Christine McElwain	And then you've got Debbie in the center and you've counted her.
Crane	We've got one person for Novice and four for General -- code. Morse code -- the CW Stuff.
Female Voice	Okay
Crane	One for Novice and four for General.
Michael Bryant	One for what?
Crane	One for Novice, four for General.
Bryant	Gonna have to take it right out here.
Crane	Okay. Then we'll have to take people out.
Byrant	Right.
Crane	Okay.
Bryant	Sandy, you sittin', you sittin' down.
Crane	Yeah, because ... (unintelligible) when you come back over here. Okay but let me see if you have the plugs out there.
Bryant	Yeah.
	(inaudible voices)
Bryant	Just grab it. Yeah ... (inaudible)
Male Voice	Okay. So nobody's got any -- all of the people that got into Technician ... (inaudible) ... all at the same time.
Bryant	Yeah, we're gonna take em', I'm gonna take em' all at the same time.

66

(inaudible voices)

Female Voice — Okay, That's fine.

Bryant — (unintelligible) ... an answer sheet.

McElwain — Okay.

(inaudible voices)

Female Voice — I can't call. My ... (inaudible)

Charles Pascal — They'll call as soon as -- These guys are working .. (cut off)

Crane — They're gonna bring em' in here and start correcting em' right now.

Male Voice — Did I give a little ... (inaudible) ... note or something that I ... (inaudible).

Crane — Yeah.

Male Voice — You don't have another letter ... (inaudible)

Crane — No, but I can, I can see.

Male Voice — Yeah, but

Male Voice — That's fine ... (inaudible)

(inaudible voices)

Bryant — Okay, wait a minute, wait a minute. Are we going to the exam?

Crane — (inaudible) outside for the test.

Bryant — Okay.

Pascal — Because I brought my tape machine and there's yours, Sandy.

Bryant — There's only six people, total, right?

Crane — Five.

Bryant	Five?
Crane	One for Novice and four for General.
Bryant	Where are the General -- General code?
Pascal	They're all up here.
Bryant	Thank you, sir.
Male Voice	(inaudible)
McElwain	I think you've got like six for a General.
Pascal	General code in here.
Bryant	General code right here.
McElwain	Here, I'll move out of your way.
Male Voice	Thank you.
McElwain	You're welcome.
Male Voice	Excuse me.
McElwain	Sure.
"Tom"	Charlie, how you doin'? Tom.
Pascal	Tom, good to see you.
	(inaudible voices)
Bryant	General code, General code. Right here. You taking General code?
Pascal	Still can't find my jacket. I , ~~no~~ it was ...
McElwain	You're still looking for your jacket?
Crane	Right there.
Male Voice	What color is it?
Crane	That's it.

Pascal — Oh, good. Yeah

Crane — The underneath one, no,the underneath one.

Pascal — Oh, the underneath one.

Crane — Brown one.

Pascal — Thanks. I'm just going to put it on.

McElwain — Expensive one. Leather one.

Pascal — Yeah

Pascal — I'm gonna find my brief case. Gonna put notes back because I guess we didn't get to review the Tech again. I -- That's all right. Time was...

McElwain — I'll get out of you way too, Charlie. Okay, I'm out of your way.

(inaudible voices)

McElwain — And your brief case is right back there.

Crane — ... Brief case is right here.

McElwain — I'm right here.

Bryant — Okay.

McElwain — Where do you want to sit me?

Bryant — Right here.

McElwain — Okay.

Bryant — Okay, everybody else ... (unintelligible) ...

Female Voice — It is ... (inaudible)

Bryant — (continuing) ... is not taken care of ... (unintelligible) ... with Sandy. You got outside.

(inaudible voices)

Female Voice — Here's a pen.

(inaudible voices)

Female Voice — Okay and what is your name? Oh, okay. All right, what time do you close? Thank you very much.

Crane — Antenna fee point? He did go over that. I remember.

(inaudible voices)

Female Voice — Oh, Okay, thank you.

(inaudible voices)

Female Voices — The Brownies are good!

Bryant — Are you taking any code?

Female Voice — What?

Female Voice — Those brownies are good.

(inaudible voices)

Female Voice — Damn.

Pascal — Whose brownies are these? Mm.

(inaudible voices)

Bryant — (inaudible) ... inside ... (inaudible) ... anywhere but inside the ... (inaudible)

Pascal — Oh, thank you.

(inaudible voices)

Crane — You're gonna meet the ... (inaudible) ... outside, aren't you? Or are you gonna sit quietly in the corner while this goes on?

Male Voice — I want to go outside right now.

(inaudible voices)

McElwain — Bruce, is Debbie going to get back in time?

Bruce Purvin	I hope so.
Female Voice	They're going to give the Novice first, aren't they?
	(inaudible)
McElwain	Oh, they're gonna to--all to me by myself with all these people in here.
McElwain	You guys whisper louder, so I can hear.
Female Voice	Hey, Can we have a little refresher ... (inaudible)
	[laughter and inaudible voices]
Male Voice	(inaudible) ... a hell of a lot anymore ... (cut off)
Female Voice	Thank you.
Male Voice	(continuing) ... (unintelligible) ... Separating a guy's application.
Crane	Okay, you guys want to ... (unintelligible)
Bryant	I don't know where he went ... (inaudible)
McElwain	You guys sure I should have answered "no" to that one question where it says ... (cut off)
Bryant	Yes.
McElwain	I should have been ... (cut off)
Bryant	No and No. 13, 10 and 11 or whatever it is?
McElwain	Nine and 10.
Bryant	Nine and 10 is both no.
McElwain	Even though I got one that's already ... (cut off)
Bryant	(unintelligible) ... is both no.
Crane	Uh, yes, sir, that -- both no. You want it thrown out? ... (unintelligible) ... have anything ... (unintelligible)

MCELWAIN CRANE

McElwain But I ... (cut off)

Bryant If you say anything but no, it's coming back.

McElwain Really?

Bryant Yeah, it's just -- it's just one of those little things like a standard.

McElwain How interesting.

Bryant If you -- have a tower 500 feet high, put no. ... (unintelligible)

Pascal That's what Tom taught. That's right. Tom's got that one right.

Female Voice Okay.

Bryant Okay. We're all set and ready to go. Charlie, you got your Novice tape in?

Pascal Uh, Sandy, Sandy. Sandy's got the tapes, Mike.

Crane No, I don't. They're out. They were out there. They're in an envelope.

Bryant I have the tapes.

Crane There they are over there.

Pascal Okay, we've got Novice, Tech and General. You want to put the Novice in.

Crane I'm going to stand at the back door and hold it so nobody walks in, Michael.

Bryant They're not going to walk in.

Bryant (inaudible) .. you going to take the code test now, please .. (cut off)

Bruce Purvin Here comes Debbie.

McElwain Okay, here comes Debbie and, oh, I told her I'd watch the kids while she took the General, so if you're going to do the Novice first, then that'll be fine.

(inaudible voices)